a plurality of cells; and

one or more test compounds whose effect on an intracellular biological or chemical process is to be evaluated;

b. introducing into each of the reaction vessels a first ligand characterized in that it associates intracellularly with a biological component whose presence or amount reveals the effect of a given test compound on the biological or chemical process; and

c. assaying for ligand-component association in the reaction vessels;

wherein the plurality of reaction vessels comprises at least 96 reaction vessels.

58. A high-throughput method for screening one or more test compounds; said method comprising steps of:

a. introducing into each of a plurality of reaction vessels:

a plurality of cells; and

one or more test compounds whose effect on an intracellular biological or chemical process is to be evaluated;

b. introducing into each of the reaction vessels a first ligand characterized in that it associates intracellularly with a biological component whose presence or amount reveals the effect of a given test compound on the biological or chemical process;

c. assaying for association between the first ligand and the component in the reaction vessels;

d. repeating step a;

e. introducing into each of the reaction vessels a second ligand characterized in that it associates intracellularly with a biological component whose presence or amount reveals the effect of a given test compound on the biological or chemical process;

f. assaying for association between the second ligand and the component in the reaction vessels;

g. optionally repeating steps d-f, wherein seconds are thirds; and

h. retaining the information as a functional fingerprint;

wherein the plurality of reaction vessels comprises at least 96 reaction vessels.

59. The method of claim 57 or 58 further comprising the step of removing unassociated ligand from each reaction vessel.

60. The method of claim 57 or 58 wherein the biological component is a direct participant in or a product of the biological or chemical process.

61. The method of claim 57 wherein the ligand is an antibody.

62. The method of claim 58 wherein each first, second and third ligand is independently an antibody.

63. The method of claim 61 or 62 wherein the antibody is conjugated to horseradish peroxidase.

64. The method of claim 57 wherein the method further comprises introducing a secondary ligand that binds specifically to said first ligand, and wherein the step of assaying comprises assaying for bound secondary ligand.

65. The method of claim 58 wherein the method further comprises introducing a secondary ligand that binds specifically to said first, second or third ligand, and wherein each step of assaying comprises assaying for bound secondary ligand.

66. The method of claim 64 or 65 wherein in the step of assaying, the secondary ligand is assayed intracellularly.

67. The method of claim 64 or 65 wherein the secondary ligand is an antibody.

68. The method of claim 67 wherein the antibody is conjugated to horseradish peroxidase.

69. The method of claim 57 or 64 wherein the step of assaying utilizes a detection technique selected from the group consisting of: chemiluminescence, fluorescence, phosphorescence, radioactivity, colorimetry, Ultra-Violet spectroscopy, and Infra-Red spectroscopy.

70. The method of claim 58 or 65 wherein each step of assaying independently utilizes a detection technique selected from the group consisting of: chemiluminescence, fluorescence, phosphorescence, radioactivity, colorimetry, Ultra-Violet spectroscopy, and Infra-Red spectroscopy.

71. The method of claim 57 or 58 wherein, in the step of introducing the cells in each of the plurality of reaction vessels, the cells adhere to the reaction vessel surface.

72. The method of claim 57 or 58 further comprising the step of providing one or more solutions containing at least one reagent characterized in that, when contacted with the cells, it perturbs or functions as an indicator of the intracellular biological or chemical process.

73. The method of claim 72 further comprising the step of contacting the cells with the one or more solutions under suitable conditions for the reagent to perturb or function as an indicator of the intracellular biological or chemical process in the cells.

74. The method of claim 73 wherein the intracellular biological or chemical process is DNA synthesis and the reagent comprises a natural or non-natural nucleotide.

75. The method of claim 74 wherein the reagent is 5-bromodeoxyuridine.

76. The method of claim 57 or 58 wherein the intracellular biological or chemical process is a covalent modification of an intracellular component.

77. The method of claim 76 wherein the covalent modification is an intracellular biological reaction.

78. The method of claim 77 wherein the intracellular biological reaction is nucleic acid synthesis, protein cleavage, peptide cleavage, carbohydrate addition, carbohydrate cleavage, metabolism of cellular components or synthesis of cellular components.

79. The method of claim 76 wherein the covalent modification is a post-translational event and the intracellular component is a protein.

80. The method of claim 79 wherein the post-translational event is protein glycosylation, methylation, lipidation, isoprenylation, ubiquitination, phosphorylation or acetylation.

F1 Cont.

81. The method of claim 79 wherein the ligand interacts with the post-translationally modified intracellular component.

83. The method of claim 57 or 58 wherein the cells are from the same cell –line.

84. The method of claim 57 or 58 wherein the cells are from a plurality of cell –lines.

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85. The method of claim 57 or 58 wherein at least a subset of the cells comprises a eukaryotic cell.

86. The method of claim 57 or 58 wherein at least a subset of the cells comprises a mammalian cell.

87. The method of claim 57 or 58 wherein at least a subset of the cells comprises a human cell.

88. The method of claim 57 or 58 wherein at least one test compound is from a synthetic source.

89. The method of claim 88 wherein the test compounds are from a combinatorial library.

90. The method of claim 89 wherein the test compounds are covalently bound on a solid support, the method further comprising the step of dissociating the test compounds from the solid support.

91. The method of claim 57 or 58 wherein the reaction vessels are designed to receive a volume of liquid less or equal to approximately 200 microliters.

92. The method of claim 57 or 58 wherein the reaction vessels are designed to receive a volume of liquid less or equal to approximately 50 microliters.

93. The method of claim 57 or 58 wherein the reaction vessels are designed to receive a volume of liquid less or equal to approximately 2 microliters.

94. The method of claim 57 or 58 wherein the reaction vessels are designed to receive a volume of liquid less or equal to approximately 250 nanoliters.

95. The method of claim 57 or 58 wherein the reaction vessels are arranged in a two-dimensional array with sufficient density that the center-to-center distance between adjacent vessels is less than about 8.5 millimeters.

96. The method of claim 57 or 58 wherein the reaction vessels are arranged in a two-dimensional array with sufficient density that the center-to-center distance between adjacent vessels is less than about 4.5 millimeters.

97. The method of claim 57 or 58 wherein the reaction vessels are arranged in a two-dimensional array with sufficient density that the center-to-center distance between adjacent vessels is less than about 2.25 millimeters.

98. The method of claim 57 or 58 wherein the reaction vessels are arranged in a two-dimensional array with sufficient density that the center-to-center distance between adjacent vessels is less than about 1 millimeter.

99. The method of claim 57 or 58 wherein the number of reaction vessels is greater than or equal to approximately 384 and the reaction vessels occupy a surface smaller than or equal to approximately 128×86 mm^2.

F2. Cont.

100. The method of claim 57 or 58 wherein the number of reaction vessels is greater than or equal to approximately 1500 and the reaction vessels occupy a surface smaller than or equal to approximately 128×86 mm^2.

101. The method of claim 57 or 58 wherein the number of reaction vessels is greater than or equal to approximately 6000 and the reaction vessels occupy a surface smaller than or equal to approximately 128×86 mm^2.

102. The method of claim 57 or 58 wherein in the step of introducing the test compounds into the plurality of reaction vessels, the test compounds are the same or different.

103. The method of claim 57 or 58 wherein in the step of introducing the test compounds into the plurality of reaction vessels, each reaction vessel contains one test compound.

Please add the following new claim:

F3. 104. The method of claim 57 or 58 wherein at least one test compound is from a natural source.

In the Specification:

Please amend the specification as follows, replacing the original paragraph by the corresponding amended paragraph detailed below. A copy of the amended paragraph, with the changes highlighted, is presented in the attached Appendix ("Version With Markings to Show Changes Made").

Please replace the paragraph on page 29 starting at line 1 and ending at line 5 with the following amended paragraph:

According to the present invention, assays are preferably performed in dense arrays of reaction vessels. Preferably, the center-to-center distance between reaction vessels is less than about 8.5 mm. More preferably, the distance is less than 4.5 mm. Even more preferably the distance is less than approximately 2.25 mm. Most preferably, the distance is less than approximately 1 mm.

REMARKS

Claims 57-103 are currently pending in the subject application. Claim 84 is withdrawn from consideration by the Examiner under 37 C.F.R. § 1.142(b) as being drawn to a non-elected invention. Claims 57-83 and 85-103 stand rejected for indefiniteness, obviousness and/or lack of novelty. Applicant has canceled claim 82, has amended claims 57-81 and 83-103, and has added new claim 104. Applicant addresses each rejection individually below as if it were applied to newly amended claims 57-81 and 83-103 and newly added claim 104.

Amendment of the Specification

The specification has been amended to correct a typographical or clerical error. Specifically, "mM" in the paragraph found at the top of page 29 has been replaced with "mm". One of ordinary skill in the art will recognize that the correct distance unit for millimeter is *mm*, not *mM*. Applicant respectfully submits that no new matter is added with this amendment.

Amendments to Claims